CLAIMS

1. An integrated search processor receiving a signal comprised of a group of spread spectrum modulated call signals sharing a common frequency band, said integrated search processor comprising:

a sample buffer for storing a limited number of data samples of said group of spread spectrum modulated call signals wherein each of said spread spectrum modulated call signals comprises a series of bits encoded in groups of a fixed length into a series of symbols having a transmission rate and wherein said data samples are stored at a rate corresponding to said transmission rate;

a PN sequence buffer for storing a limited number of PN sequence data chips wherein said PN sequence data chips correspond to a PN sequence used to modulate at least one call signal in said group of spread spectrum modulated call signals;

a despreader for correlating a portion of said data samples of said group of spread spectrum call signals stored in said sample buffer with a portion of said PN sequence data chips stored in said PN sequence buffer and for producing a correlated output corresponding to a single symbol; and

a transform engine for decoding said correlated output to produce an estimate of said series of bits wherein said transform engine decodes said correlated output at a rate higher than said transmission rate.

2. The integrated search processor of claim 1, wherein said sample buffer is capable of storing two symbols worth of said data samples and wherein said PN sequence buffer is capable of storing four symbols worth of said PN sequence data chips.

3. The integrated search processor of claim 1, wherein each symbol in said series of symbols is comprised of a series of code bits and wherein, in said at least one call signal, each of said code bits is modulated by a plurality of said PN sequence data chips and wherein said limited number of data samples stored in said sample buffer are stored such that two of said data samples are stored for each of said PN sequence data chips.

4. The integrated search processor of claim 1, wherein said estimate of said series of bits comprises a probability corresponding to each possible value of said groups of said fixed length, further comprising a maximum detector for receiving said estimate and providing a soft decision

output value indicative of a maximum energy level of said correlated output.

5. The integrated search processor of claim 1, wherein said rate at which said transform engine decodes said correlated output is 32 times higher than said transmission rate.

6. The integrated search processor of claim 1 further comprising a demodulation element for producing despread call data wherein said transform engine decodes said despread call data.

7. The integrated search processor of claim 1 wherein said series of bits are Walsh encoded in said groups of said fixed length.

8. The integrated search processor of claim 7 wherein said transform engine is a fast Hadamard transformer.

9. The integrated search processor of claim 4 further comprising an accumulator for summing successive ones of said soft decision output values.

10. The integrated search processor of claim 1 further comprising a search controller for providing signaling information.

11. The integrated search processor of claim 9 wherein a plurality of said series of symbols are grouped into a power control group wherein each symbol in said power control group has a common transmitted power level.

12. The integrated search processor of claim 11 wherein said accumulator sums said soft decision output values corresponding to symbols having a common power control group.

13. The integrated search processor of claim 1 wherein said despreader produces said correlated output at said rate higher than said transmission rate and wherein each of said correlated outputs corresponds to a time delay offset from a zero offset reference time

14. The integrated search processor of claim 10 wherein said sample buffer is comprised of an even and an odd sample buffer wherein if the previous data sample is stored in said even sample buffer then the subsequent data sample is stored in said odd sample buffer and if the previous data sample is stored in said odd sample buffer then the subsequent data sample is stored in said even sample buffer.

15. The integrated search processor of claim 1 wherein each symbol in said series of symbols is comprised of a series of code bits and wherein, in said at least one call signal, each of said code bits is modulated by four of said PN sequence data chips and wherein said limited number of data samples stored in said sample buffer are stored such that two of said data samples are stored for each of said PN sequence data chips, and wherein each sample is four bits.

16. A method of receiving a signal comprised of a group of spread spectrum call signals sharing a common frequency band in a modem operating under control of a modem microprocessor, and isolating one of said call signals from among said group to determine a call signal strength at a path delay time offset from a zero offset reference time, said method comprising the steps of:

storing PN sequence data bits in a PN sequence buffer;

storing a first received set of call signal samples in a sample buffer having a limited size;

despreading a first fixed length set of said call signal samples from said sample buffer corresponding to a first path delay time with a first set of PN sequence data bits from said PN sequence buffer to produce a first despread output;

storing a second received set of call signal samples in said sample buffer; and

despreading a second fixed length set of call signal samples from said sample buffer corresponding to a second path delay time with said first set of PN sequence data bits from said PN sequence buffer to produce a second despread output;

wherein said second fixed length set of call signal samples comprises a large number of the same call signal samples as said first fixed length set of call signal samples and wherein the length of said first and second received set of call signal samples is a fraction the fixed length of said first and second fixed length set of call signal samples.

17. The method of claim 16 for receiving and isolating one of said call signals from among said group of call signals wherein the step of despreading said first fixed length set of call signal samples from said sample buffer is conditioned upon there being a sufficient number of valid call signal samples available in said sample buffer to evaluate said signal strength at said first path delay time.

18. The method of claim 16 for receiving and isolating one of said call signals from among said group of call signals further comprising the step of selecting an antenna from a plurality of available antennas to supply said call signal samples.

19. The method of claim 16 for receiving and isolating one of said call signals from among said group of call signals further comprising the steps of:

storing a third received set of call signal samples in said sample buffer;

despreading a third fixed length set of call signal samples from said sample buffer corresponding to a third path delay time with a second set of PN sequence data bits from said PN sequence buffer to produce a third despread output;

storing a fourth received set of call signal samples in said sample buffer; and

despreading a fourth fixed length set of call signal samples from said sample buffer corresponding to a fourth path delay time with said second set of PN sequence data bits from said PN sequence buffer to produce a fourth despread output;

wherein said fourth fixed length set of call signal samples comprises a large number of the same call signal samples as said third fixed length set of call signal samples and wherein the length of said third and fourth received set of call signal samples is a fraction of the fixed length of said first and second fixed length set of call signal samples.

20. The method of claim 19 for receiving and isolating one of said call signals from among said group of call signals further comprising the steps of:

determining a first call signal strength corresponding to said first despread output;

determining a second call signal strength corresponding to said second despread output;

determining a third call signal strength corresponding to said third despread output; and

determining a fourth call signal strength corresponding to said fourth despread output.

21. The method of claim 20 for receiving and isolating one of said call signals from among said group of call signals further comprising the steps of:

summing said first call signal strength and said third call signal strength; and

summing said second call signal strength and said fourth call signal strength;

wherein said first path delay time is the same as said third path delay time and wherein said second path delay time is the same as said fourth path delay time.

22. The method of claim 21 for receiving and isolating one of said call signals from among said group of call signals further comprising the step of providing a largest summed result to said modem microprocessor.

23. The method of claim 20 for receiving and isolating one of said call signals from among said group of call signals wherein said step of determining said first call signal strength comprises the step of decoding said first despread output using a fast Hadamard transform to produce soft decision data.

24. The method of claim 16 for receiving and isolating one of said call signals from among said group of call signals wherein each of said spread spectrum modulated call signals comprises a series of bits encoded in groups of a fixed length into a series of symbols comprised of a series of code bits.

25. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein said series of bits is Walsh encoded and said series of symbols are Walsh symbols.

26. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein each of said code bits of said one isolated call signal are modulated by a plurality of said PN sequence data bits.

27. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein each of said code bits of said one isolated call signal are modulated by four of said PN sequence data bits.

28. The method of claim 27 for receiving and isolating one of said call signals from among said group of call signals wherein two call signal samples are stored in said sample buffer for each PN sequence data bits.

29. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein said limited size of said sample buffer corresponds to two symbols worth of data samples.

30. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein said PN sequence data buffer is capable of storing four symbols worth of PN sequence data bits.

31. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein first fixed length set of call signal samples corresponds to one symbols worth of data.

32. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein first receive set of call signal samples corresponds to 1/32 of a symbol.

33. The method of claim 16 for receiving and isolating one of said call signals from among said group of call signals wherein said in step of storing said first and second receive set of call signal samples, said first and second receive set of call signal samples are stored at the same rate at which call signal samples are transmitted.

34. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals wherein a series of said

symbols are grouped together in a power control group wherein each symbol in a common power control group is transmitted at a fixed power level.

35. The method of claim 24 for receiving and isolating one of said call signals from among said group of call signals further comprising the steps of:

despreading a third fixed length set of call signal samples from said sample buffer corresponding to a third path delay time with a second set of PN sequence data bits from said PN sequence buffer to produce a third despread output;

despreading a fourth fixed length set of call signal samples from said sample buffer corresponding to a fourth path delay time with said second set of PN sequence data bits from said PN sequence buffer to produce a fourth despread output;

wherein said fourth fixed length set of call signal samples comprises a large number of the same call signal samples as said third fixed length set of call signal samples;

determining a first call signal strength corresponding to said first despread output;

determining a second call signal strength corresponding to said second despread output;

determining a third call signal strength corresponding to said third despread output;

determining a fourth call signal strength corresponding to said fourth despread output.

summing said first call signal strength and said third call signal strength; and

summing said second call signal strength and said fourth call signal strength;

wherein said first path delay time is the same as said third path delay time and wherein said second path delay time is the same as said fourth path delay time and wherein said first fixed length set of call signal samples and third fixed length set of call signal samples correspond to a common power control group.